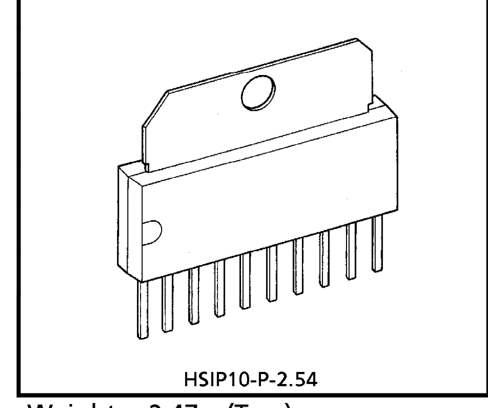
TOSHIBA BIPOLAR LINEAR INTEGRATED CIRCUIT SILICON MONOLITHIC

TA7288P

DUAL BRIDGE DRIVER

The TA7288P is a bridge driver that is ideal for normal / reverse switching.
This circuit offers four modes : normal rotation, reverse rotation, stop, and brake.
The output current is 1.0A (AVE.) and 2.0A (PEAK).
TA7288P has an ideal circuit configuration for VCR front tape loading and offers two types of power supply pins. One is for output, the other for control. The V_{ref} pin on the output side used to control the motor voltage facilitates motor voltage adjustment. The IC requires little input current, enabling direct connection with CMOS.

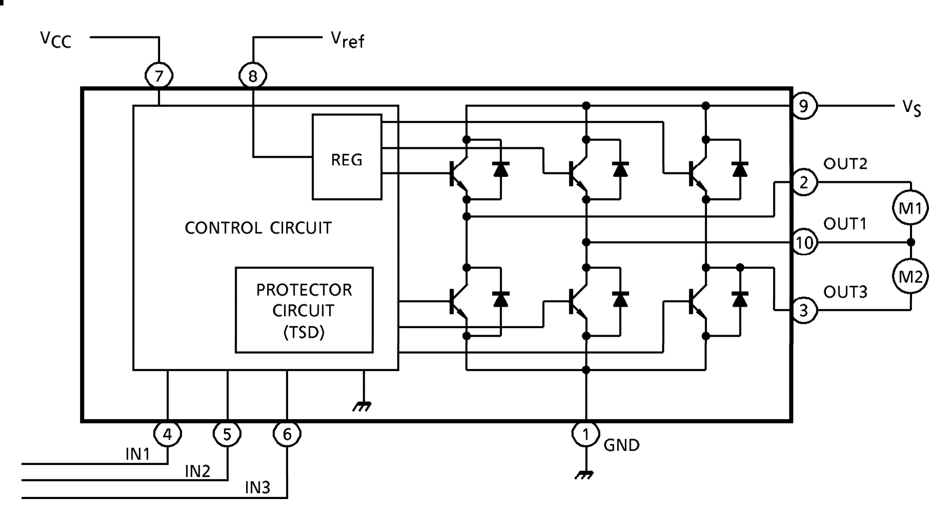


Weight : 2.47g (Typ.)

FEATURES

- 4 Modes Available (CW / CCW / STOP / BRAKE)
- Output Current Up to 1.0A (AVE.) and 2.0A (PEAK)
- Wide Range of Operating Voltage : $V_{CC (opr.)} = 4.5\sim18V$
  $V_{S (opr.)} = 0\sim18V$
  $V_{ref (opr.)} = 0\sim18V$
- Build in Thermal Shutdown, Over Current Protector and Punch-Through Current Restriction Circuit.
- Hysteresis for All Inputs.

BLOCK DIAGRAM

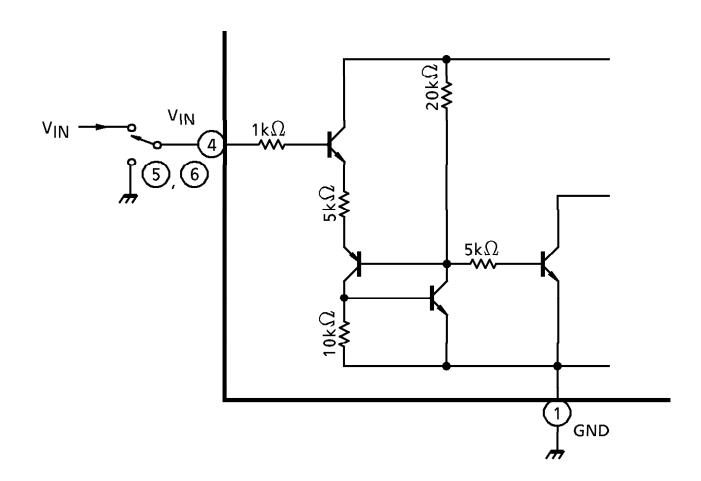


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PIN FUNCTION

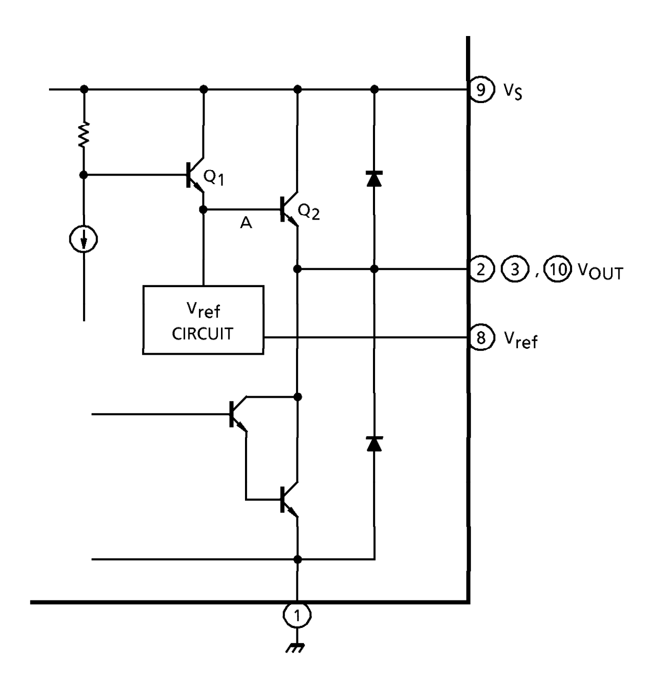
PIN No.	SYMBOL	FUNCTIONAL DESCRIPTION
1	GND	GND terminal
2	OUT2	Output terminal
3	OUT3	Output terminal
4	IN1	Input terminal
5	IN2	Input terminal
6	IN3	Input terminal
7	V_{CC}	Supply voltage terminal for Logic
8	V_{ref}	Supply voltage terminal for control
9	V_S	Supply voltage terminal for Motor drive
10	OUT1	Output terminal

INPUT CIRCUIT



Input terminals of pin④, ⑤ and pin⑥ are all high active type and have a hysteresis of 0.7V (Typ.) 5μA type of source mode input current is required.

OUTPUT CIRCUIT



Output voltage is controlled by V_{ref} voltage. Relationship between V_{OUT} and V_{ref} is

$V_{OUT} = V_{BE}$ (≒0.7) + V_{ref}

V_{ref} terminal required to connect to V_S terminal for stable operation in case of no requirement of V_{OUT} control.

FUNCTION

INPUT			OUTPUT			MODE	
IN1	IN2	IN3	OUT1	OUT2	OUT3	M1	M2
0	0	1 / 0	L	L	L	BRAKE	BRAKE
1	0	0	H	L	∞	CW / CCW	STOP
1	0	1	L	H	∞	CCW / CW	STOP
0	1	0	H	∞	L	STOP	CW / CCW
0	1	1	L	∞	H	STOP	CCW / CW
1	1	1 / 0	L	L	L	BRAKE	BRAKE

∞ : High impedance

(Note) Inputs are all high active type.

MAXIMUM RATINGS ($Ta = 25°C$)

CHARACTERISTIC		SYMBOL	RATING	UNIT
Supply Voltage		V_{CC}	25	V
Motor Drive Voltage		V_S	25	V
Reference Voltage		V_{ref}	25	V
Output Current	PEAK	$I_{O\ (PEAK)}$	2.0 (Note 1)	A
	AVE.	$I_{O\ (AVE.)}$	1.0	A
Power Dissipation		P_D	12.5 (Note 2)	W
Operating Temperature		T_{opr}	−30~75	°C
Storage Temperature		T_{stg}	−55~150	°C

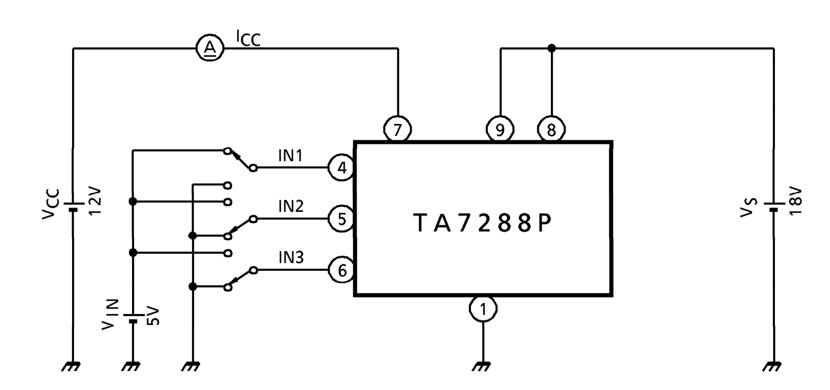
(Note 1) Duty 1 / 10, 100ms
(Note 2) $Tc = 25°C$

ELECTRICAL CHARACTERISTICS (Unless otherwise noted, $Ta = 25°C$, $V_{CC} = 12V$, $V_S = 18V$)

CHARACTERISTIC		SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Supply Current		I_{CC1}	1	Output OFF CW / CCW mode	—	17	30	mA
		I_{CC2}	1	Output OFF Brake mode	—	13	25	
Input Voltage	1 (High)	$V_{IN\ (H)}$	2	$T_j = 25°C$ pin④, ⑤, ⑥	3.5	—	5.5	V
	2 (Low)	$V_{IN\ (L)}$	2	$T_j = 25°C$ pin④, ⑤, ⑥	GND	—	0.8	
Input Current		I_{IN}	2	$V_{IN} = 3.5V$, Sink mode	—	5	20	μA
Input Hysteresis Voltage		ΔV_T	2	—	—	0.7	—	V
Saturation Voltage	Upper	$V_{SAT\ U\text{-}1}$	3	$V_{ref} = V_S$, V_S-V_{out}, $I_O = 0.2A$	—	0.9	1.2	V
	Lower	$V_{SAT\ L\text{-}1}$	3	$V_{ref} = V_S$, V_{out}-GND, $I_O = 0.2A$	—	1.0	1.3	V
	Upper	$V_{SAT\ U\text{-}2}$	3	$V_{ref} = V_S$, V_S-V_{out}, $I_O = 1.0A$	—	1.3	1.6	V
	Lower	$V_{SAT\ L\text{-}2}$	3	$V_{ref} = V_S$, V_{out}-GND, $I_O = 1.0A$	—	1.8	2.5	V
Output Voltage		$V_{SAT\ U\text{-}1'}$	3	$V_{ref} = 10V$, V_{out}-GND $I_O = 0.5A$	10.7	11.0	11.8	V
		$V_{SAT\ U\text{-}2'}$	3	$V_{ref} = 10V$, V_{out}-GND $I_O = 1.0A$	10.4	10.7	11.5	V
Leakage Current	Upper	$I_{L\ U}$	—	$V_S = 25V$	—	—	50	μA
	Lower	$I_{L\ L}$	—	$V_S = 25V$	—	—	50	
Diode Forward Voltage	Upper	$V_{F\ U}$	4	$I_F = 1A$	—	2.2	—	V
	Lower	$V_{F\ L}$	4	$I_F = 1A$	—	1.4	—	
Reference Current		I_{ref}	2	$V_{ref} = 10V$, Source mode	—	5	30	μA

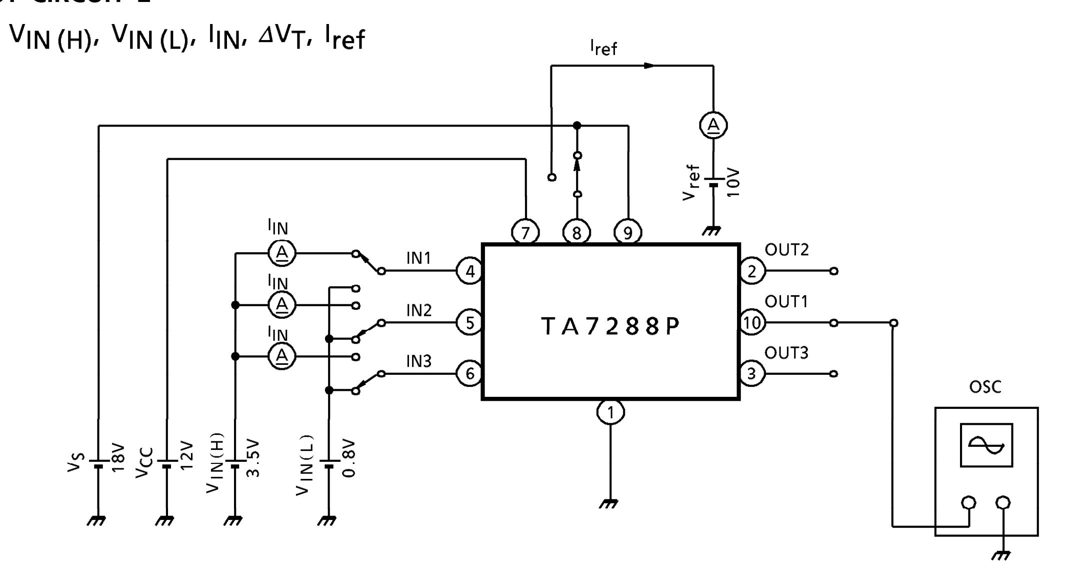
TEST CIRCUIT 1

$I_{CC1, 2}$



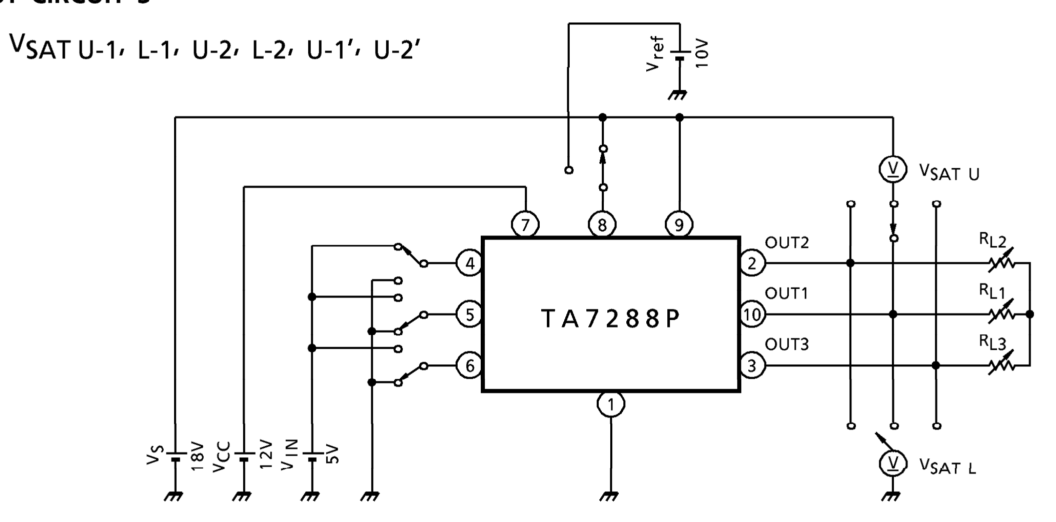
TEST CIRCUIT 2

$V_{IN (H)}$, $V_{IN (L)}$, I_{IN}, ΔV_T, I_{ref}



TEST CIRCUIT 3

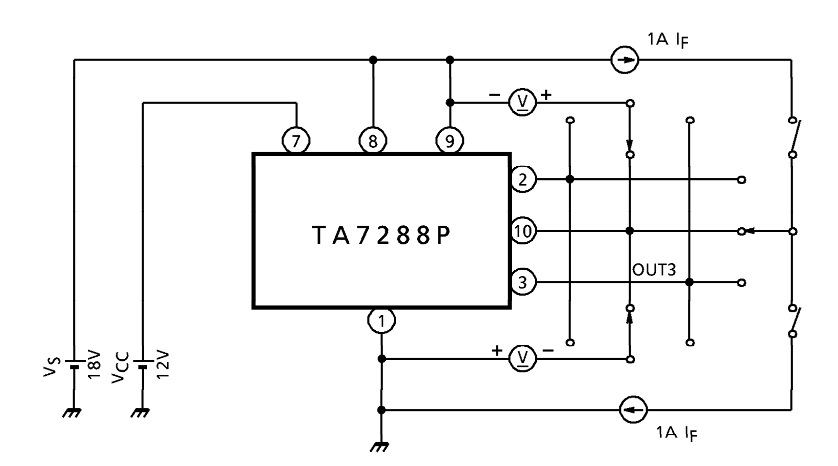
V_{SAT} U-1, L-1, U-2, L-2, U-1', U-2'

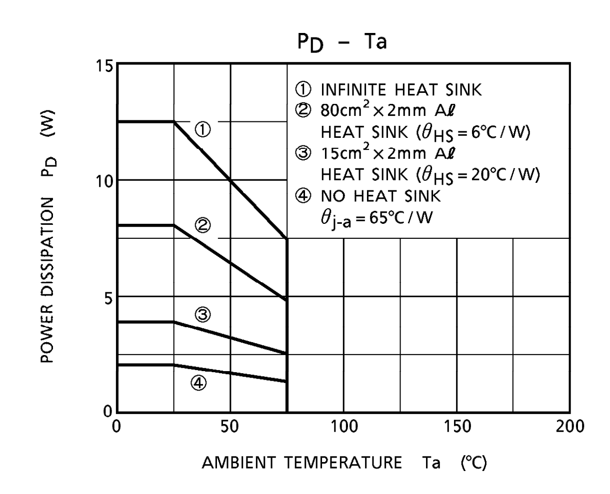


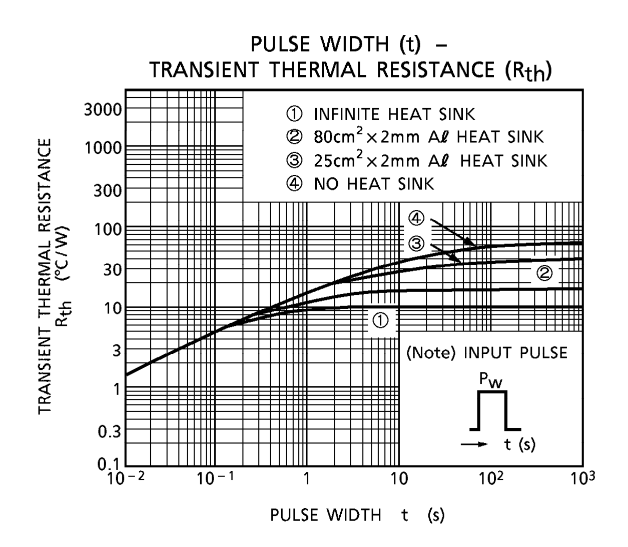
I_O calibration is required to adjust specified values of test conditions by $R_{L1} \sim R_{L3}$.

TEST CIRCUIT 4

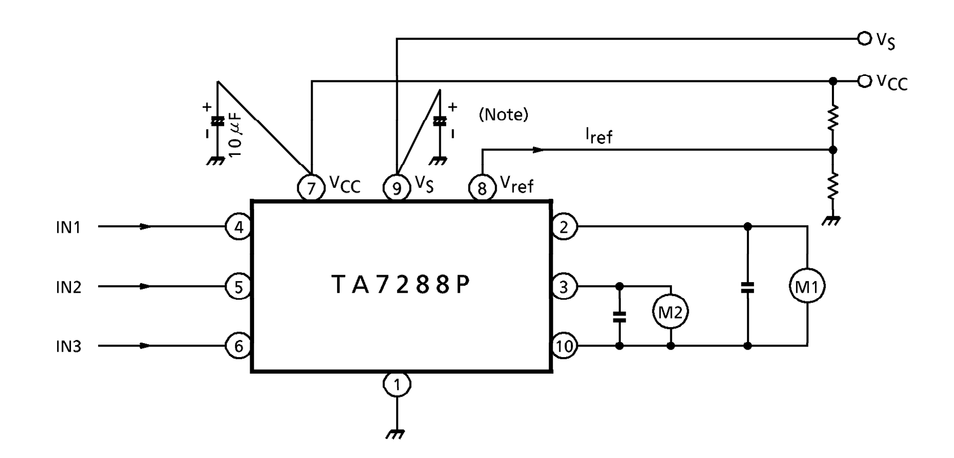
V_F U, L







APPLICATION CIRCUIT



(Note 1) Connect if required

(Note 2) Utmost care is necessary in the design of the output line, V_S and GND line since IC may be destroyed due to short-circuit between outputs, air contamination fault, or fault by improper grounding.

OUTLINE DRAWING

HSIP10-P-2.54

Unit : mm

Weight : 2.47g (Typ.)